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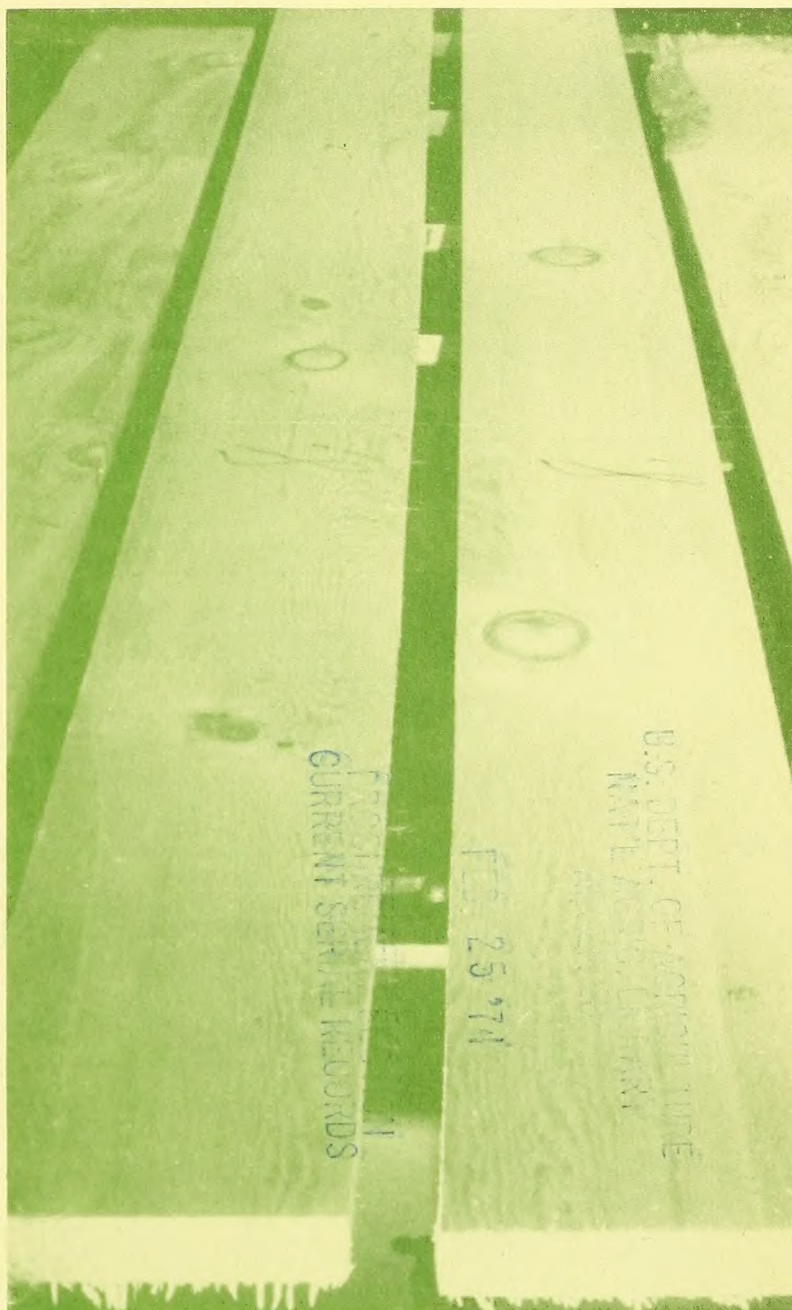
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CURRENT SERVICE RECORDS

FEB 25 1974

U.S. DEPT. OF AGRICULTURE  
NATIONAL FOREST SERVICE

FROM

WESTERN WHITE PINE  
IN NORTHERN IDAHO

153, 30p. map. 1973.

MARLIN E. PLANK AND  
THOMAS A. SNELLGROVE

[\*pinus monticola] ✓



## ACKNOWLEDGMENTS

The recovery information presented in this report is the result of the cooperation of several organizations and a great many people. Loggers, truckers, scalers, foresters, and others made it possible to carry out this research.

Particular thanks is due the following organizations:

Idaho Forest Industries, Atlas Tie Division--for providing milling facilities and help from mill production personnel.

Region 1, U.S. Forest Service--for aid in planning the study and for personnel supplied during the milling operations.

Coeur d'Alene National Forest--personnel for fieldwork and milling operations.

Western Wood Products Association--for providing a grading supervisor.

## ABSTRACT

*A sample of 300 trees was selected to represent the full range in size and quality of commercial sawtimber available in northern Idaho. A net log scale of 167,900 board feet (Scribner) was sawn from 1,431 logs in a typical white pine mill, producing 212,703 board feet of lumber.*

*Lumber yields for each lumber grade are presented by log grade and diameter class. The study showed a recovery of 17 percent molding and selects; 5 percent No. 3 clear, No. 1 and 2 shop; and 78 percent commons.*

*Keywords: Log yield, western white pine, lumber, forest industries.*

## CONTENTS

	Page
INTRODUCTION . . . . .	1
STUDY PROCEDURES . . . . .	2
Timber Sample . . . . .	2
Logging, Identification, and Diagraming . . . . .	3
Transportation and Scaling . . . . .	3
Lumber Manufacturing . . . . .	3
Sawing . . . . .	5
Drying and Surfacing . . . . .	5
Lumber Grading and Tallying . . . . .	5
Cubic Volume: Logs, Chips, and Sawdust . . . . .	5
RESULTS . . . . .	6
APPENDIX . . . . .	11



# LIST OF TABLES

	Page
Table 1.--Averages for some characteristics of study trees by sample areas . . . . .	3
Table 2.--Distribution of study logs by scaling diameter and log grade . . . . .	4
Table 3.--The distribution of study logs by length and grade . . . . .	4
Table 4.--Percent of lumber tally by thickness, width, and lumber grade . . . . .	12
Table 5.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 1 logs . . . . .	13
Table 6.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 2 logs . . . . .	14
Table 7.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 3 logs . . . . .	15
Table 8.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 4 logs . . . . .	16
Table 9.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 9 logs . . . . .	17
Table 10.--Log scale, lumber tally, and cubic volumes by scaling diameter for all log grades . . . . .	18
Table 11.--Lumber tally volume by 1-inch diameter class for log grade 1 . . . . .	19
Table 12.--Lumber tally volume by 1-inch diameter class for log grade 2 . . . . .	20
Table 13.--Lumber tally volume by 1-inch diameter class for log grade 3 . . . . .	21
Table 14.--Lumber tally volume by 1-inch diameter class for log grade 4 . . . . .	22
Table 15.--Lumber tally volume by 1-inch diameter class for log grade 9 . . . . .	23
Table 16.--Lumber tally volume by 1-inch diameter class for all log grades . . . . .	24
Table 17.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 1 . . . . .	25
Table 18.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 2 . . . . .	26
Table 19.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 3 . . . . .	27
Table 20.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 4 . . . . .	28
Table 21.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 9 . . . . .	29
Table 22.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for all log grades . . . . .	30



## INTRODUCTION

The United States contains an estimated 21 billion board feet of western white pine sawtimber.<sup>1/</sup> Although western white pine ranges through the States of Idaho, Montana, Washington, Oregon, and California, about two-thirds of the board-foot volume is found in the area known as the "Inland Empire."<sup>2/</sup> Approximately 93 percent of the western white pine lumber produced in the United States in 1970 was manufactured in this area.<sup>3/</sup> For the years 1970-71, stumpage values for western white pine substantially exceeded the stumpage values of all other species in the Inland Empire.<sup>4/</sup>

Since it is the most valuable species in this area, accurate valuation of this timber resource is important. Updated lumber recovery information for western white pine sawtimber is needed for better utilization and evaluation of the resource.

The lack of recent recovery information for evaluating western white pine sawtimber prompted a cooperative study between the Pacific Northwest Forest and Range Experiment Station, the Northern Region (Region 1) of the National Forest System, and the Idaho Forest Products Company. The purpose of the study was twofold--first, to obtain recovery information for appraisal purposes and, second, to provide information with which to improve or develop log or tree grading systems.

The specific purpose of this report is to present information on the type and volume of lumber that was produced under current industry manufacturing practices from a sample of the various grades and sizes of western white pine logs available to sawmills in northern Idaho. This information is most useful to timber appraisers, buyers, and processors, forest land managers, and forest inventory personnel.

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<sup>1/</sup> Information from most recent inventories of Forest Survey at the Pacific Northwest Forest and Range Experiment Station and the Intermountain Forest and Range Experiment Station.

<sup>2/</sup> Inland Empire is northern Idaho, west slopes of the Rocky Mountains in Montana, and eastern Washington and Oregon.

<sup>3/</sup> Western Wood Products Association 1970 Statistical Yearbook. WWPA Stat. Dep., 28 p., 1971.

<sup>4/</sup> David R. Darr. Production, prices, employment, and trade in Northwest forest industries, fourth quarter 1971. USDA Forest Serv. Pac. Northwest Forest & Range Exp. Stn., 55 p., 1972.



## STUDY PROCEDURES

### Timber Sample

A sample of 300 trees was selected to represent the full range in size and quality of commercial sawtimber available in northern Idaho. However, two trees were not delivered to the mill; thus, this report is based on the remaining 298 sample trees. The trees were obtained from eight sample areas, shown in figure 1, on the Kaniksu, St. Joe, and Coeur d'Alene National Forests. The eight sample areas were chosen to represent differences in tree size, stem quality, and site characteristics. Within each sample area, individual trees were selected on the basis of d.b.h. to fulfill overall sample objectives. The total sample was not intended to be representative of the normal mix for any particular mill or specified time. Averages for some characteristics of the sample trees by area are shown in table 1.

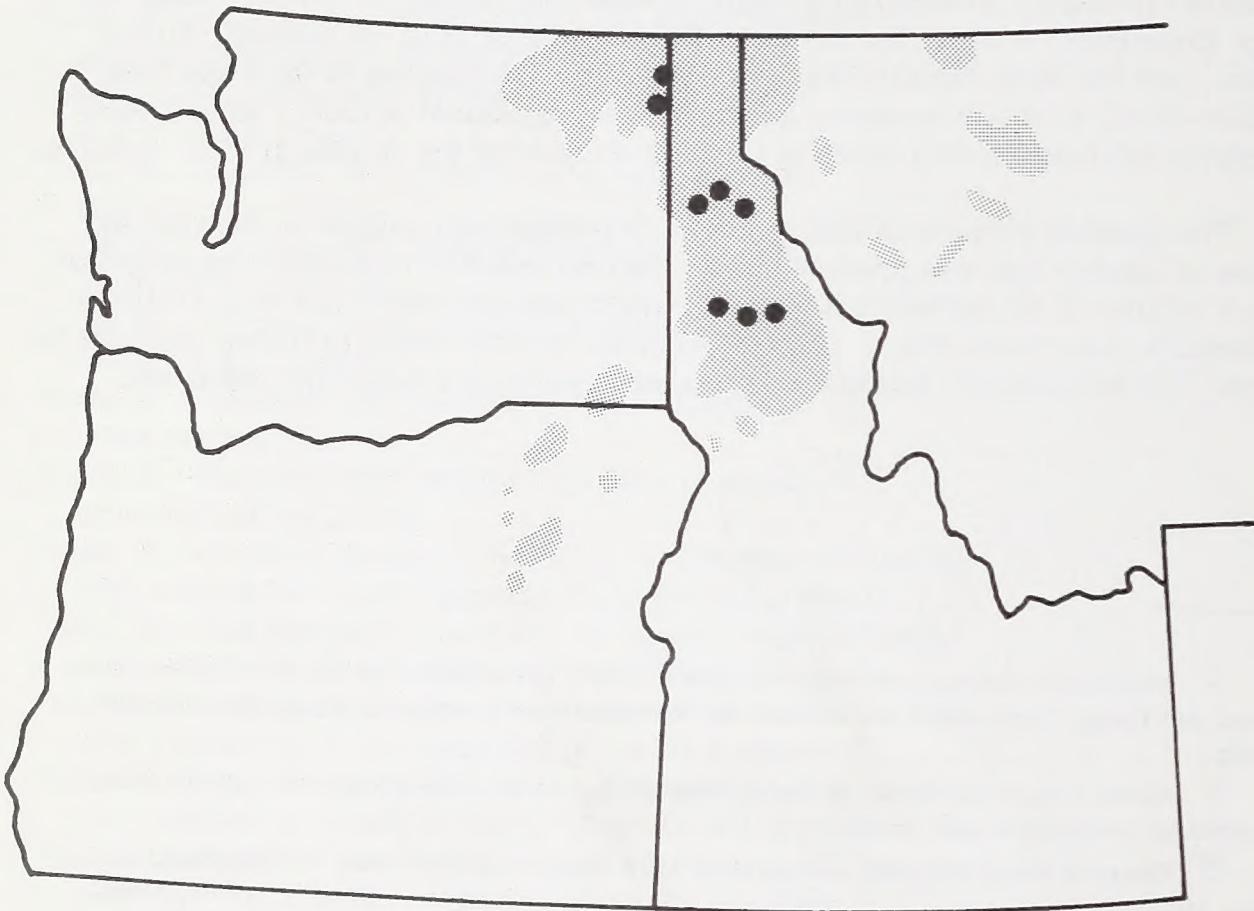


Figure 1.--Range of western white pine in the "Inland Empire" and general location of the eight areas from which study trees were cut.



Table 1.--Averages for some characteristics of study trees by sample areas

Characteristic	Sample area								Total
	1	2	3	4	5	6	7	8	
d.b.h. range (inches)	9.9-33.1	11.0-29.6	10.4-45.0	10.9-21.9	9.1-22.3	26.5-54.0	10.5-34.1	9.3-24.3	9.1-54.0
average d.b.h. (inches)	14.4	23.5	20.9	17.1	13.3	38.4	21.9	15.2	19.2
tree height range (feet)	60-125	83-173	71-200	80-144	81-125	144-215	71-179	84-137	60-215
average tree height (feet)	94	142	126	114	102	184	142	109	120
defect range (percent)	0-66	0-51	0-91	0-19	0-29	10-98	0-56	0-39	0-98
average defect (percent)	9.2	10.9	18.6	7.8	4.0	40.5	13.8	4.4	12.8
age range (years)	49-134	107-211	60-170	58-111	53-88	237-336	123-290	58-77	49-336
average age (years)	74	176	93	84	66	299	213	66	117
number of trees	70	25	54	20	40	26	27	36	298

## LOGGING, IDENTIFICATION, AND DIAGRAMING

The study trees were felled and bucked into saw logs by cooperating logging contractors according to normal industry practice. Each log was tagged in the woods to identify its origin with respect to tree and position in the tree.

The visible surface characteristics of each log were examined and recorded immediately after the trees were felled. Hence, the relationship of the external characteristics of a log to its lumber grades and yield could be analyzed to refine or develop log or tree grades. This record was also used to determine the grade<sup>5/</sup> of the logs presented in this report.

## TRANSPORTATION AND SCALING

The study logs were trucked to the cooperating mill for scaling and storage before sawing. The woods-length logs were scaled in the yard by the Western Wood Products Association and the U. S. Forest Service in accordance with the National Forest Service Log Scaling Handbook as of 1968. The logs were bucked in the yard and rescaled as mill-length logs according to the above rules. In this report, all log volumes are based on this scale.

The 298 sample trees produced 1,402 merchantable logs. The distribution of these logs plus the 29 cull logs by scaling diameter, length, and log grade is shown in tables 2 and 3.

## Lumber Manufacturing

Sawing, drying, and surfacing practices of the mill were representative of general industry practice in that area. Log identity was maintained on each piece of lumber through the manufacturing process to the final point of grade and tally.

<sup>5/</sup> Forest Survey Grades - U. S. Forest Service Form R1-2420-3.



Table 2.--Distribution of study logs by scaling diameter and log grade

Log diameter (inches)	Log grade					
	1	2	3	4	9	All grades
----- Number of logs -----						
4	0	0	1	0	0	1
5	0	0	4	1	0	5
6	0	0	26	14	0	40
7	0	0	60	55	0	115
8	0	1	46	80	0	127
9	0	0	29	113	0	142
10	0	1	30	108	0	139
11	0	3	12	104	0	119
12	0	3	10	96	1	110
13	0	2	6	85	1	94
14	0	2	4	77	0	83
15	0	1	2	65	0	68
16	0	2	1	47	1	51
17	0	1	0	49	3	53
18	0	1	0	31	2	34
19	0	5	1	26	3	35
20	0	4	2	23	2	31
21	1	5	0	24	1	31
22	0	2	0	16	2	20
23	1	4	0	9	1	15
24	0	2	0	11	1	14
25	0	5	1	11	0	17
26	0	1	1	7	2	11
27	0	4	0	4	1	9
28	1	4	0	6	1	12
29	1	4	0	3	2	10
30	0	2	0	2	2	6
31	0	7	0	2	1	10
32	0	4	0	1	0	5
33	0	2	0	5	0	7
34	0	2	0	0	1	3
35	0	2	0	2	0	4
36	0	3	1	1	1	6
37	0	0	0	0	0	0
38	0	0	0	1	0	1
39	1	1	0	0	0	2
40	0	0	0	0	0	0
41	0	1	0	0	0	1
42	0	0	0	0	0	0
Total	5	81	237	1,079	29	1,431

Table 3.--The distribution of study logs by length and grade

Length (feet)	Log grade					
	1	2	3	4	9	All grades
----- Number of logs -----						
8	0	0	8	10	0	18
10	0	0	18	24	1	43
12	0	5	43	121	2	171
14	1	2	10	53	2	77
16	4	72	142	831	23	1,072
18	0	2	7	27	0	36
20	0	0	1	13	0	14
Total	5	81	237	1,079	29	1,431



SAWING

The study logs were sawn under normal production conditions with the objective of obtaining the highest value from each log. Logs up to and including 20 feet in length were sawn. Lumber on the green chain did not exceed 16 feet because longer items were cut into two pieces. Shop items were sawn to 5/4-inch thickness and all other items to 4/4-inch.

Production equipment in the sawmill included a double-arbor edger and a 24-foot gang trimmer. A vertical band resaw located outside the mill was used to convert 8/4-inch-thick stock into 1-inch boards.

DRYING AND SURFACING

After the logs were sawn, all study lumber was kiln dried and surfaced according to general industry practices.

LUMBER GRADING AND TALLYING

A Western Wood Products Association grading inspector either graded or supervised the grading of study lumber on the planer chain. All study lumber was graded under the Western Wood Products Association, "Rules for Grading Western Lumber, July 1, 1968."

Each lumber item produced was placed in one of the following grades:

B and Better (Supreme)	No. 2 Shop
C Select (Choice)	No. 1 Common (Colonial)
D Select (Quality)	No. 2 Common (Sterling)
Molding	No. 3 Common (Standard)
No. 3 Clear	No. 4 Common (Utility)
No. 1 Shop	No. 5 Common (Industrial)

Each piece of lumber was tallied by its shipping dimensions and grade and by log number.

CUBIC VOLUME: LOGS, CHIPS, AND SAWDUST

In addition to lumber grade and board-foot volume data collected, the cubic volume of logs, lumber, residues, and sawdust was calculated for all study logs.

The gross cubic-foot log volume was computed by the following formula:

$$V = \frac{\pi L (D_s^2 + D_s D_e + D_e^2)}{4 \times 3 \times 144}$$

where

- V = Gross cubic-foot log volume
- D<sub>s</sub> = Diameter in inches of small end of log
- D<sub>e</sub> = Diameter in inches of large end of log
- L = Log length in feet



The lumber cubic volumes, shown in tables 5-10 of the appendix, are based on actual dimensions of the surfaced dry lumber taken from the planer settings at the time of the study.

The sawdust cubic volumes, also shown in tables 5-10 of the appendix, were calculated by using an average saw kerf of 0.25 inch and the computed surface area of the rough green lumber from each log.

The combined volumetric shrinkage plus the cubic volume of planer shavings was calculated by subtracting the cubic volume of surfaced dry lumber from the cubic volume of rough green lumber.

The residue volume was calculated by subtracting the lumber, sawdust, volumetric shrinkage, and planer shaving volumes from the gross cubic log volume. It includes a small amount of sawdust produced from the production of slabs, edging, and trim ends.

## RESULTS

The 1,402 merchantable logs produced 203,053 board feet of lumber. The average weighted recovery of merchantable logs was 122 percent. A significant linear relationship was found between percent recovery and diameter (see fig. 2). As expected, percent recovery decreased with an increase in diameter.

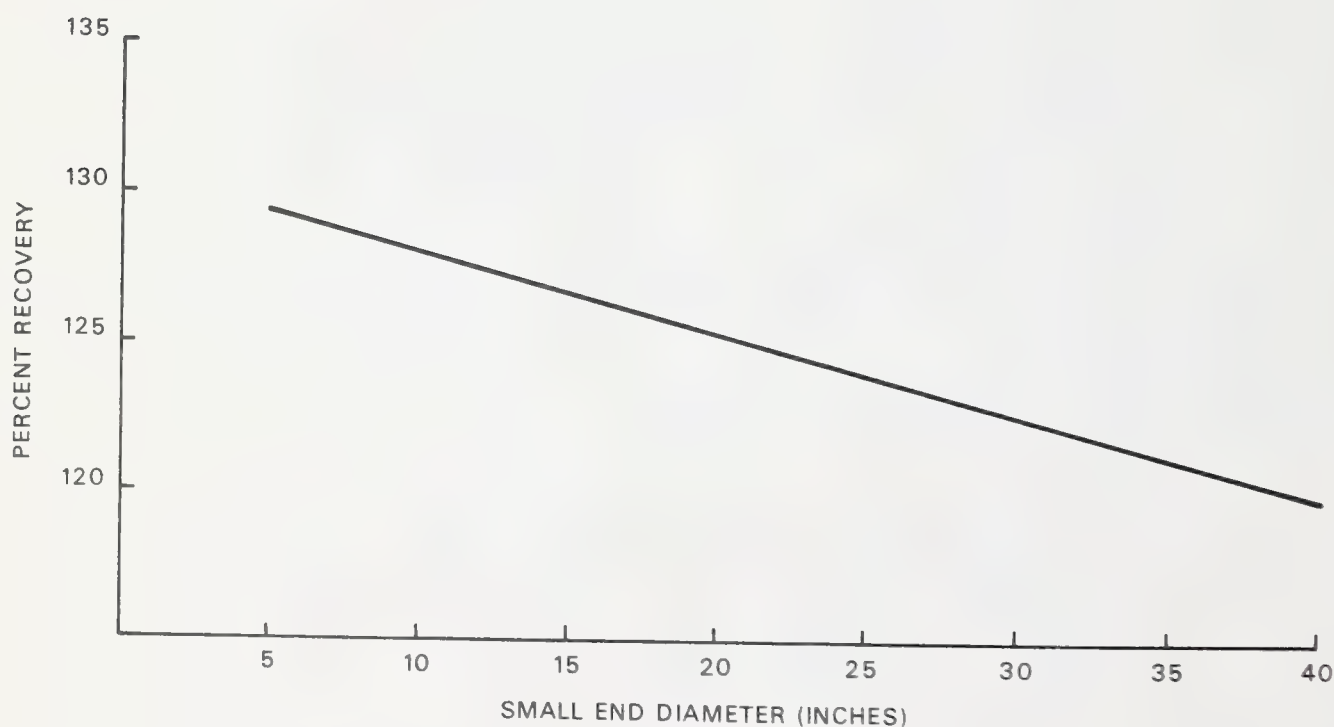


Figure 2.--Percent recovery of all merchantable logs over log scaling diameter.



Detailed lumber yield, chippable residue, and sawdust volume information according to log size and log grade are shown in the appendix (tables 4 through 22). Lumber volume from the study is summarized by thickness, width, and grade in table 4. Eighty-five percent of the lumber volume produced was in 1-inch boards, and 5/4-inch shop items accounted for the remainder of the lumber production. The average lumber grade yield for each log grade is shown in figure 3.

The log scale, lumber tally, and cubic volumes obtained for each log are summarized by scaling diameter and log grade in tables 5 through 10.

The lumber grade yields, by scaling diameter and log grade, are shown in tables 11 through 16. Tables 17 through 22 show lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class and log grade. Curves of that lumber grade recovery are shown in figures 4, 5, and 6. Because of insufficient data at the extremes, the curves were not extended through the entire diameter range of the logs.

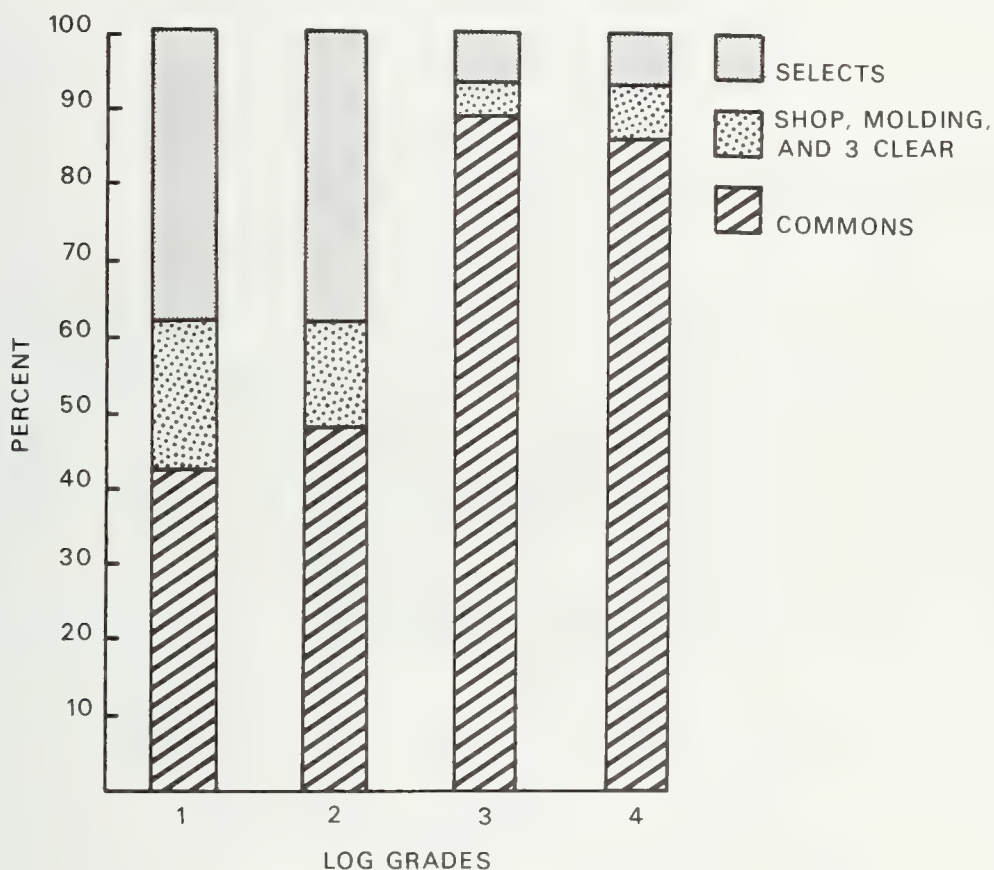


Figure 3.--Lumber grade yield expressed as a percent of the total volume for each log grade. (Includes 29 cull logs.)



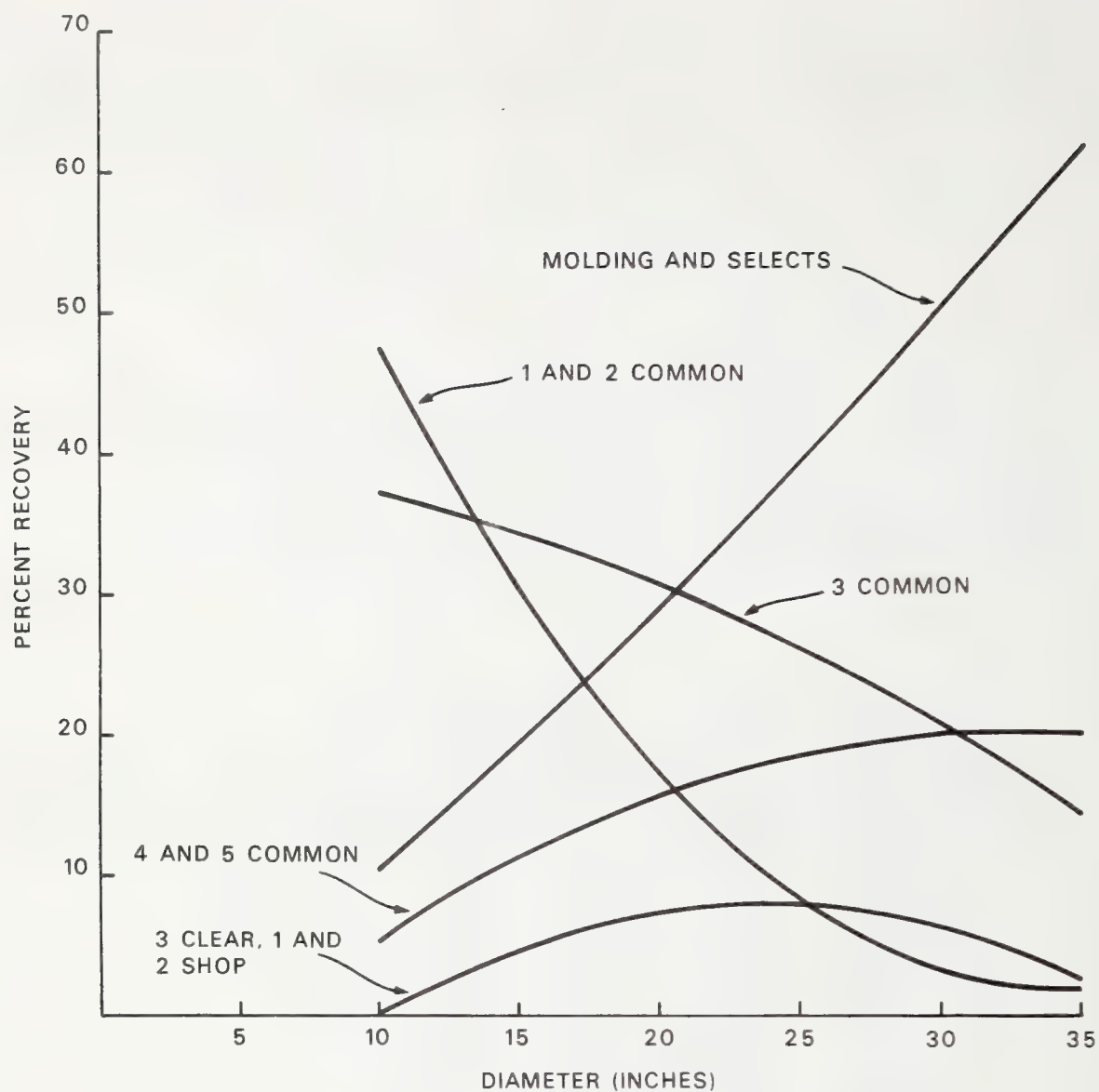


Figure 4.--Lumber recovery expressed as a percent of lumber tally volume over diameter--log grade 2.

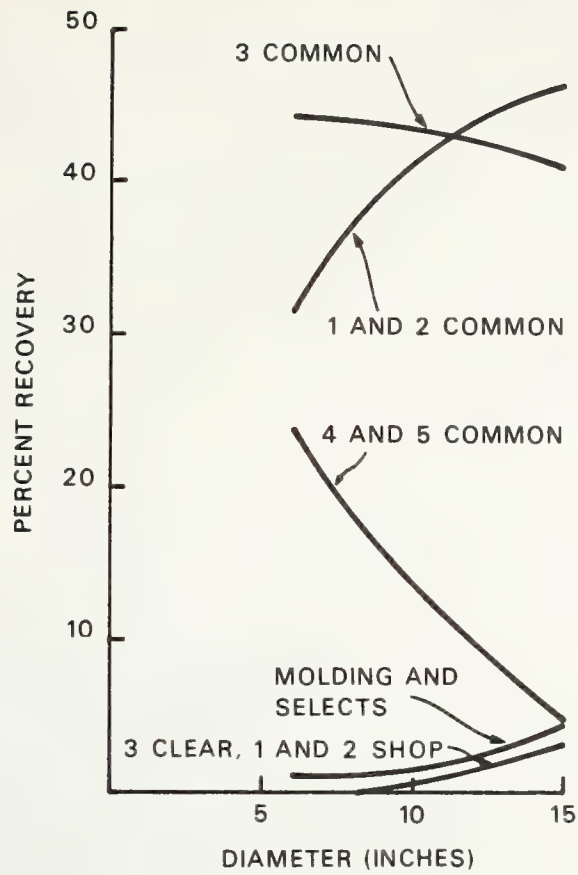


Figure 5.--Lumber recovery expressed as a percent of lumber tally volume over diameter--log grade 3.

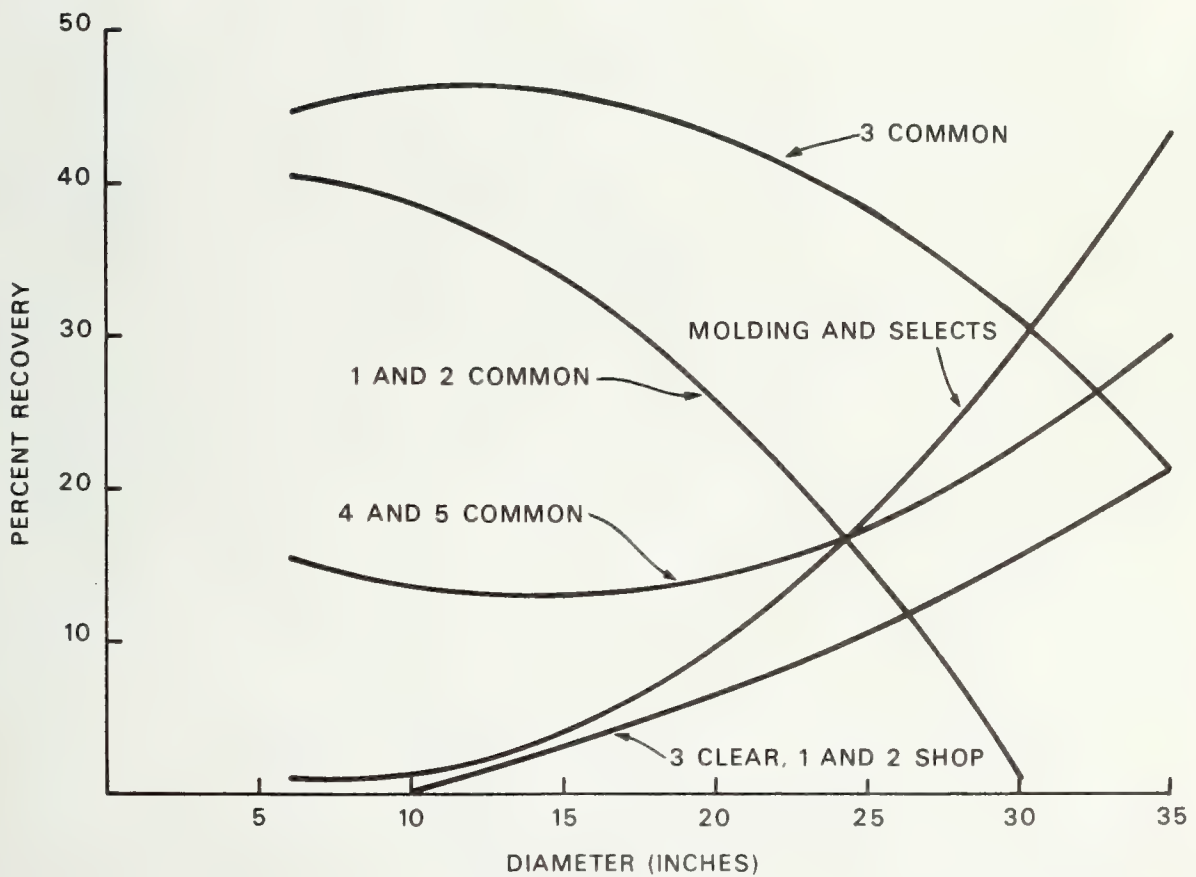


Figure 6.--Lumber recovery expressed as a percent of lumber tally volume over diameter--log grade 4.





**APPENDIX**

TABLES OF LUMBER RECOVERY DATA BY DIAMETER AND LOG GRADE



Table 4.--Percent of lumber tally by thickness, width, and lumber grade<sup>1/</sup>

Width (inches)	Volume	Lumber grade												
		B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common	Total
Board feet		Percentage of lumber tally												
1 inch thick:														
4	12,121	0.08	0.33	0.59	0.30	0	0	0	0.08	0.97	2.15	0.97	0.23	5.70
6	47,605	.26	.99	1.90	.51	.13	.35	.26	.20	2.90	7.26	4.64	2.99	22.39
8	31,759	.05	.41	.56	.29	.17	.23	.15	.20	4.87	6.52	1.41	.06	14.92
10	25,453	.09	.29	.79	.25	.56	.58	.29	.16	3.41	4.52	1.00	.01	11.95
12	63,814	.20	.77	1.81	.83	1.07	1.02	.51	.55	5.83	13.23	4.08	.12	30.02
Total	180,752	.68	2.79	5.65	2.18	1.93	2.18	1.21	1.19	17.98	33.68	12.10	3.41	84.98
1-1/4 (5/4) inches thick:														
4	2,044	.10	.23	.13	.15	(2/)	(2/)	(2/)	.02	.17	.10	.05	.02	.97
6	5,152	.16	.30	.27	.04	(2/)	(2/)	(2/)	.06	.79	.64	.15	0	2.41
8	4,636	.07	.19	.13	.02	(2/)	(2/)	(2/)	.05	.76	.56	.40	.01	2.19
10	6,222	.12	.25	.45	.27	(2/)	(2/)	(2/)	.04	.66	.66	.45	.02	2.92
12	13,897	.37	.81	1.07	.43	(2/)	(2/)	(2/)	.03	1.05	1.97	.80	.00	6.53
Total	31,951	.82	1.78	2.05	.91	(2/)	(2/)	(2/)	.20	3.43	3.93	1.85	.05	15.02
Total	212,703	1.50	4.57	7.70	3.09	1.93	2.18	1.21	1.39	21.41	37.61	13.95	3.46	100.00

<sup>1/</sup> Includes 29 cul1 logs.<sup>2/</sup> The cooperating mill chose not to produce any of these items for this study.

Table 5.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 1 logs

Log scaling diameter (inches)	Number of logs	Log scale		Lumber tally		Cubic volume						
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings	Residue	
		--- Board feet ---			Percent		--- Cubic feet ---					
21	1	300	190	227	119	58.77	13.91	24	5.48	6.06	33.32	
22	0	--	--	--	--	--	--	--	--	--	--	
23	1	380	350	405	116	51.24	26.82	52	8.98	10.03	5.41	
24	0	--	--	--	--	--	--	--	--	--	--	
25	0	--	--	--	--	--	--	--	--	--	--	
26	0	--	--	--	--	--	--	--	--	--	--	
27	0	--	--	--	--	--	--	--	--	--	--	
28	1	510	300	435	145	64.69	26.21	41	10.74	12.14	15.60	
29	1	610	560	615	110	80.53	39.66	49	14.17	15.92	10.78	
30	0	--	--	--	--	--	--	--	--	--	--	
31	0	--	--	--	--	--	--	--	--	--	--	
32	0	--	--	--	--	--	--	--	--	--	--	
33	0	--	--	--	--	--	--	--	--	--	--	
34	0	--	--	--	--	--	--	--	--	--	--	
35	0	--	--	--	--	--	--	--	--	--	--	
36	0	--	--	--	--	--	--	--	--	--	--	
37	0	--	--	--	--	--	--	--	--	--	--	
38	0	--	--	--	--	--	--	--	--	--	--	
39	1	1,120	730	860	118	149.47	56.66	38	19.43	20.65	52.73	
Total	5	2,920	2,130	2,542	119	404.70	163.26	40	58.80	64.80	117.84	



Table 6.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 2 logs

Log scaling diameter (inches)	Number of logs	Log scale		Lumber tally		Cubic volume						Residue
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings		
		Board feet		Percent		Cubic feet		Percent		Cubic feet		
8	1	30	30	39	130	6.51	2.33	36	1.01	1.09	2.08	
9	0	--	--	--	--	--	--	--	--	--	--	
10	1	60	50	62	124	13.82	3.66	26	1.52	1.69	6.95	
11	3	210	200	215	107	48.83	13.40	27	5.12	5.61	24.70	
12	3	240	220	316	144	58.12	19.31	33	7.77	8.58	22.46	
13	2	200	150	207	138	45.54	12.75	28	5.02	5.63	22.14	
14	2	220	140	259	185	40.80	15.94	39	6.29	6.93	11.64	
15	1	140	140	170	121	21.76	10.74	49	3.89	4.30	2.83	
16	2	320	310	350	113	62.94	22.42	36	8.10	9.19	23.23	
17	1	180	180	223	124	27.57	14.24	52	5.24	5.98	2.11	
18	1	210	180	165	92	52.60	9.90	19	4.19	4.52	33.99	
19	5	1,200	1,050	1,359	129	234.20	84.66	36	32.44	36.93	80.17	
20	4	1,080	1,080	1,199	111	164.75	77.33	47	27.42	31.15	28.85	
21	5	1,500	1,360	1,629	120	246.84	103.23	42	38.30	43.80	61.51	
22	2	660	640	752	117	108.96	47.64	44	17.70	20.26	23.36	
23	4	1,520	1,220	1,675	137	241.37	107.24	44	38.89	44.07	51.17	
24	2	800	750	905	121	138.69	58.05	42	20.95	23.61	36.08	
25	5	2,240	1,750	2,050	117	349.74	130.74	37	47.70	53.55	117.75	
26	1	560	560	587	105	73.99	37.86	51	13.57	15.17	7.39	
27	4	2,060	1,500	1,684	112	289.81	108.70	37	38.91	43.00	99.20	
28	4	2,180	1,540	2,009	130	302.46	127.95	42	47.04	52.61	74.86	
29	4	2,290	2,020	2,191	108	300.64	140.00	47	51.23	57.50	51.91	
30	2	1,150	840	1,085	129	151.52	71.00	47	24.68	26.96	28.88	
31	7	4,790	3,010	4,614	153	726.70	289.93	40	109.26	122.02	205.49	
32	4	3,050	2,330	3,079	132	453.50	197.65	44	71.69	79.54	104.62	
33	2	1,560	1,300	1,737	134	217.61	114.88	53	39.11	42.97	20.65	
34	2	1,600	1,400	1,598	114	219.87	102.11	46	37.30	41.57	38.89	
35	2	1,760	1,600	1,803	113	323.46	116.13	36	41.66	46.24	119.43	
36	3	2,760	1,690	2,591	153	491.88	161.36	33	62.19	68.92	199.41	
37	0	--	--	--	--	--	--	--	--	--	--	
38	0	--	--	--	--	--	--	--	--	--	--	
39	1	1,120	1,100	1,195	109	147.68	78.29	53	27.12	29.85	12.42	
40	0	--	--	--	--	--	--	--	--	--	--	
41	1	1,270	1,120	1,176	105	232.12	78.95	34	25.99	27.98	99.20	
Total	81	36,960	29,460	36,924	125	5,794.28	2,358.39	41	861.30	961.22	1,613.37	

Table 7.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 3 logs

Log scaling diameter (inches)	Number of logs	Log scale		Lumber tally		Cubic volume						Residue	
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings			
- - - - - Board feet - - - - - Percent - - - - - Cubic feet - - - - - Cubic feet - - - - -													
4	1	10	10	14	140	3.42	0.79	23	0.35	0.36	1.92		
5	4	40	40	61	152	14.53	3.63	25	1.57	1.59	7.74		
6	26	400	350	489	140	109.48	29.04	27	12.65	13.16	54.63		
7	60	1,420	1,400	1,657	118	309.67	99.34	32	42.18	45.36	122.79		
8	46	1,190	1,180	1,594	135	301.01	97.30	32	39.10	42.27	122.34		
9	29	1,040	1,010	1,287	127	228.44	79.41	35	31.33	34.31	83.39		
10	30	1,560	1,550	1,897	122	304.35	118.49	39	45.47	50.14	90.25		
11	12	750	740	915	124	144.92	57.10	39	22.04	24.33	41.45		
12	10	750	750	955	127	143.95	59.61	41	22.77	25.20	36.37		
13	6	580	560	720	129	116.76	44.73	38	17.24	19.30	35.49		
14	4	440	440	577	131	78.72	36.70	47	13.47	14.99	13.56		
15	2	250	250	293	117	40.55	18.36	45	7.04	7.94	7.21		
16	1	160	150	204	136	24.66	12.98	53	4.71	5.37	1.60		
17	0	--	--	--	--	--	--	--	--	--	--		
18	0	--	--	--	--	--	--	--	--	--	--		
19	1	240	240	292	122	35.81	18.67	52	6.76	7.70	2.68		
20	2	560	500	598	120	81.88	37.86	46	14.09	16.07	13.86		
21	0	--	--	--	--	--	--	--	--	--	--		
22	0	--	--	--	--	--	--	--	--	--	--		
23	0	--	--	--	--	--	--	--	--	--	--		
24	0	--	--	--	--	--	--	--	--	--	--		
25	1	340	310	360	116	44.69	23.12	52	8.37	9.50	3.70		
26	1	500	470	501	107	65.64	31.96	49	11.63	13.31	8.74		
27	0	--	--	--	--	--	--	--	--	--	--		
28	0	--	--	--	--	--	--	--	--	--	--		
29	0	--	--	--	--	--	--	--	--	--	--		
30	0	--	--	--	--	--	--	--	--	--	--		
31	0	--	--	--	--	--	--	--	--	--	--		
32	0	--	--	--	--	--	--	--	--	--	--		
33	0	--	--	--	--	--	--	--	--	--	--		
34	0	--	--	--	--	--	--	--	--	--	--		
35	0	--	--	--	--	--	--	--	--	--	--		
36	1	920	850	1,017	120	126.62	67.45	53	22.80	24.70	11.67		
Total	237	11,150	10,800	13,431	124	2,175.10	836.54	38	323.57	355.60	659.39		





Table 9.--Log scale, lumber tally, and cubic volumes by scaling diameter for grade 9 logs

Log scaling diameter (inches)	Number of logs	Log scale		Lumber tally		Cubic volume					Residue
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings	
		Board feet			Percent	Cubic feet		Percent		Cubic feet	
12	1	80	20	63	315	17.97	3.82	21	1.59	1.77	10.79
13	1	100	0	123	--	16.51	7.46	45	3.02	3.40	2.63
14	0	--	--	--	--	--	--	--	--	--	--
15	0	--	--	--	--	--	--	--	--	--	--
16	1	120	30	132	440	18.86	8.13	43	3.22	3.68	3.83
17	3	540	90	553	614	88.63	33.21	37	13.74	15.44	26.24
18	2	420	0	493	--	81.95	29.94	37	12.11	13.68	26.22
19	3	720	120	605	504	118.70	37.20	31	14.80	16.79	49.91
20	2	450	70	406	580	66.22	24.93	37	10.15	11.35	20.33
21	1	300	80	230	288	51.79	13.86	27	5.67	6.41	25.85
22	2	660	120	631	526	111.24	38.26	34	15.48	17.60	39.90
23	1	380	0	347	--	47.61	20.86	44	8.67	9.72	8.36
24	1	400	0	323	--	60.22	19.25	32	8.13	9.03	23.81
25	0	--	--	--	--	--	--	--	--	--	--
26	2	1,000	0	860	--	128.45	52.20	41	21.14	23.87	31.24
27	1	550	0	435	--	88.02	26.03	30	10.93	12.19	38.87
28	1	580	140	378	270	76.17	22.68	30	9.44	10.60	33.45
29	2	1,140	260	902	347	172.73	54.94	32	22.13	24.78	70.88
30	2	1,140	320	1,084	339	154.68	66.84	43	26.21	29.42	32.21
31	1	530	0	392	--	69.28	24.31	35	9.45	10.46	25.06
32	0	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--
34	1	800	200	656	328	114.86	39.39	34	16.38	18.39	40.70
35	0	--	--	--	--	--	--	--	--	--	--
36	1	920	0	1,037	--	164.67	63.20	38	25.46	28.76	47.25
Total	29	10,830	1,450	9,650	666	1,648.56	585.97	36	237.72	267.34	557.53



Table 10.--Log scale, lumber tally, and cubic volumes by scaling diameter for all log grades

Log scaling diameter (inches)	Number of logs	Log scale		Lumber tally		Cubic volume					Residue
		Gross	Net	Volume	Recovery ratio	Log	Surface dry lumber	Lumber recovery ratio	Green sawdust	Volumetric shrinkage and planer shavings	
		Board feet		Percent		Cubic feet		Percent	Cubic feet		
4	1	10	10	14	140	3.42	0.79	23	0.35	0.36	1.92
5	5	50	50	77	154	18.40	4.57	25	1.99	2.03	9.81
6	40	640	590	754	128	170.09	44.74	26	19.58	20.38	85.39
7	115	2,900	2,850	3,294	116	620.97	197.47	32	83.66	90.04	249.80
8	127	3,420	3,340	4,597	138	856.26	279.48	33	113.75	123.42	339.61
9	142	5,310	5,140	6,683	130	1,202.51	410.54	34	162.86	177.99	451.12
10	139	7,650	7,400	8,608	116	1,520.79	534.29	35	207.78	229.30	549.42
11	119	7,840	7,530	9,790	130	1,585.98	609.20	38	234.93	258.93	482.92
12	110	8,530	8,250	10,735	130	1,702.93	670.11	39	256.88	284.04	491.90
13	94	9,080	8,520	10,776	126	1,740.35	673.86	39	256.43	284.84	525.22
14	83	8,780	8,490	11,036	130	1,751.04	694.73	40	260.41	290.45	505.42
15	68	9,250	8,940	10,735	120	1,635.89	674.96	41	253.01	284.71	423.21
16	51	7,880	7,390	9,266	125	1,401.19	583.32	42	218.68	248.79	350.40
17	53	9,360	8,310	10,973	132	1,571.19	691.47	44	258.62	295.41	325.69
18	34	6,970	6,350	8,208	129	1,157.70	517.35	45	193.55	225.41	225.41
19	35	8,130	7,010	8,706	124	1,321.57	548.70	42	205.48	234.60	332.79
20	31	8,210	7,440	9,819	119	1,222.75	556.93	46	207.86	237.39	220.57
21	31	9,000	7,880	9,545	121	1,418.43	600.47	42	225.57	257.95	334.44
22	20	6,530	5,310	6,847	129	1,015.34	429.45	42	162.82	185.92	237.15
23	15	5,450	4,510	5,587	124	794.53	352.36	44	131.70	150.60	159.87
24	14	5,450	4,690	5,830	124	820.86	369.00	45	137.21	155.96	158.69
25	17	7,040	5,560	6,776	122	1,015.93	427.17	42	159.86	180.23	248.67
26	11	5,170	3,930	5,145	131	681.41	322.72	47	122.19	139.19	97.31
27	9	4,460	2,840	3,717	131	619.95	237.25	38	86.89	96.32	199.49
28	12	6,610	5,150	6,299	122	880.60	394.02	45	149.98	169.95	166.65
29	10	5,640	4,240	5,398	127	770.45	342.23	44	126.79	142.67	158.76
30	6	3,520	2,300	3,384	147	476.81	213.26	45	80.07	89.62	93.86
31	10	6,560	4,080	6,183	152	956.27	388.38	41	146.52	163.92	257.45
32	5	3,790	3,040	3,739	123	554.56	239.94	43	87.03	96.95	130.64
33	7	5,270	4,520	5,439	120	705.49	347.37	49	127.08	141.73	89.31
34	3	2,400	1,600	2,254	141	334.73	141.50	42	53.68	59.96	79.59
35	4	3,520	3,180	3,620	114	553.74	229.70	41	85.04	95.22	143.78
36	6	5,520	3,450	5,578	162	907.15	351.10	39	132.32	147.17	276.56
37	0	--	--	--	--	--	--	--	--	--	--
38	1	1,070	1,060	1,060	100	135.02	67.55	50	24.75	27.67	15.05
39	2	2,240	1,830	2,055	112	297.15	134.95	45	46.55	50.50	65.15
40	0	--	--	--	--	--	--	--	--	--	--
41	1	1,270	1,120	1,176	105	232.12	78.95	34	25.99	27.98	99.20
Total	1,431	194,520	167,900	212,703	127	32,653.57	13,359.88	41	5,047.89	5,663.58	8,582.22

Table 11.--Lumber tally volume by 1-inch diameter class for log grade 1

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
21	1	227	10	70	10	44	0	0	0	8	8	8	19	50
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--
23	1	405	0	42	61	32	11	0	0	45	104	90	20	0
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	0	--	--	--	--	--	--	--	--	--	--	--	--	--
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	1	435	6	--	43	0	26	28	32	0	0	93	133	69
29	1	615	0	42	90	74	48	30	48	0	4	74	205	0
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	0	--	--	--	--	--	--	--	--	--	--	--	--	--
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1	860	92	276	239	115	0	16	0	11	0	40	27	44
Total	5	2,542	108	435	443	265	85	74	80	64	116	305	404	163



Table 12.--Lumber tally volume by 1-inch diameter class for log grade 2

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
8	1	39	0	7	0	0	0	0	0	0	7	20	5	0
9	0	--	--	--	--	--	--	--	--	--	--	--	--	--
10	1	62	0	0	4	0	0	0	0	0	34	24	0	0
11	3	215	0	3	6	3	0	0	0	5	121	77	0	0
12	3	316	12	0	46	5	0	0	0	8	121	105	15	4
13	2	207	0	12	24	0	0	0	0	0	79	68	24	0
14	2	259	0	0	18	0	0	0	0	8	65	100	40	28
15	1	170	21	13	23	0	0	8	0	0	55	50	0	0
16	2	350	6	18	38	0	0	0	0	56	128	29	48	27
17	1	223	3	5	31	0	10	13	0	0	0	145	16	0
18	1	165	5	36	36	4	0	0	0	0	0	31	34	19
19	5	1,359	13	157	191	13	81	40	37	0	120	405	251	51
20	4	1,199	5	130	194	55	62	25	0	46	206	402	68	6
21	5	1,629	32	139	221	37	111	75	0	0	344	484	176	10
22	2	752	0	30	171	52	16	0	0	0	126	337	15	5
23	4	1,675	12	53	325	134	107	22	62	42	169	551	170	28
24	2	905	4	73	95	98	64	117	5	6	109	210	98	26
25	5	2,050	99	250	302	112	77	23	39	46	48	620	298	136
26	1	587	12	113	96	42	20	64	0	0	34	126	67	13
27	4	1,684	110	279	261	218	12	12	0	0	84	372	188	148
28	4	2,009	168	293	270	267	32	57	6	0	73	468	292	83
29	4	2,191	161	220	351	334	123	96	16	7	50	358	369	106
30	2	1,085	111	276	131	110	8	12	0	0	7	134	181	115
31	7	4,614	107	643	1,066	417	0	8	48	22	115	1,024	682	482
32	4	3,079	72	448	946	245	53	46	16	6	120	418	497	212
33	2	1,737	232	456	337	237	48	47	5	0	5	161	152	62
34	2	1,598	123	261	251	121	0	16	16	0	76	445	239	50
35	2	1,803	6	352	535	202	0	16	0	0	56	327	181	128
36	3	2,591	70	416	605	433	12	90	22	0	19	243	310	371
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1	1,195	216	271	214	138	0	0	16	0	98	141	89	12
40	0	--	--	--	--	--	--	--	--	--	--	--	--	--
41	1	1,176	87	519	234	145	0	0	0	7	25	67	37	55
Total	81	36,924	1,687	5,473	7,022	3,422	836	787	283	259	2,494	7,942	4,542	2,177

Table 13.--Lumber tally volume by 1-inch diameter class for log grade 3

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
<i>Volume by grade</i>														
4	1	14	0	0	0	0	0	0	0	0	0	3	11	0
5	4	61	0	0	0	0	0	0	0	0	20	16	19	6
6	26	489	0	0	2	0	0	0	0	6	158	202	94	27
7	60	1,657	0	16	7	6	0	0	0	15	512	779	300	22
8	46	1,594	0	0	3	0	0	0	0	34	479	773	289	16
9	29	1,287	0	0	0	0	0	0	0	52	483	549	193	10
10	30	1,897	0	0	10	0	0	0	0	70	903	725	189	0
11	12	915	5	0	21	0	0	0	0	4	321	469	95	0
12	10	955	0	0	4	0	0	0	0	5	449	406	91	0
13	6	720	8	34	13	0	0	0	0	36	354	192	83	0
14	4	577	0	0	5	0	0	0	0	9	280	208	64	11
15	2	293	0	0	3	5	13	0	0	13	156	78	25	0
16	1	204	0	0	30	0	0	0	0	0	16	125	33	0
17	0	--	--	--	--	--	--	--	--	--	--	--	--	--
18	0	--	--	--	--	--	--	--	--	--	--	--	--	--
19	1	292	0	6	26	27	37	0	0	14	48	92	42	0
20	2	598	0	2	12	0	67	13	7	0	104	372	17	4
21	0	--	--	--	--	--	--	--	--	--	--	--	--	--
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--
23	0	--	--	--	--	--	--	--	--	--	--	--	--	--
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	1	360	10	17	57	0	36	10	12	29	44	115	30	0
26	1	501	8	10	64	60	97	29	0	0	53	108	72	0
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	0	--	--	--	--	--	--	--	--	--	--	--	--	--
29	0	--	--	--	--	--	--	--	--	--	--	--	--	--
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	1	1,017	145	150	181	87	123	8	0	0	32	175	112	4
Total	237	13,431	176	235	438	185	373	60	19	287	4,412	5,387	1,759	100



Table 14.--Lumber tally volume by 1-inch diameter class for log grade 4

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
5	1	16	0	0	0	0	0	0	0	3	9	4	0	0
6	14	265	0	0	3	0	0	0	0	7	124	86	0	2
7	55	1,637	5	5	5	5	0	0	0	16	547	779	43	28
8	80	2,964	0	17	11	14	0	0	0	82	877	1,428	247	59
9	113	5,396	0	6	39	20	0	0	0	95	1,827	2,623	749	37
10	108	6,649	10	3	63	0	0	4	0	70	2,600	3,195	636	68
11	104	8,660	6	19	86	22	8	0	0	343	3,507	3,708	905	56
12	96	9,401	5	26	152	8	0	0	0	202	3,870	3,976	1,071	42
13	85	9,726	13	71	203	30	0	21	0	207	3,550	4,213	1,309	75
14	77	10,200	4	63	162	31	0	17	3	178	3,684	4,715	1,275	68
15	65	10,272	12	89	208	77	48	68	42	100	3,427	4,783	1,312	106
16	47	8,580	3	80	158	29	13	47	62	151	2,861	4,224	862	90
17	49	10,197	66	213	394	124	82	162	174	265	2,854	4,836	918	109
18	31	7,550	56	136	341	54	118	121	140	128	1,759	3,609	1,027	61
19	26	6,450	0	89	213	73	101	354	164	136	1,371	3,064	837	48
20	23	6,616	12	136	322	72	130	347	186	58	1,186	2,946	1,134	87
21	24	7,459	38	203	443	96	351	348	191	104	1,398	3,054	1,108	125
22	16	5,464	23	201	456	169	145	387	144	16	702	2,067	1,065	89
23	9	3,160	18	30	219	27	188	235	85	56	324	1,622	344	12
24	11	4,602	39	163	426	110	168	191	138	30	294	2,234	712	97
25	11	4,366	87	218	442	172	181	107	91	24	318	1,454	932	340
26	7	3,197	82	148	435	213	186	192	92	36	262	1,015	496	40
27	4	1,598	102	163	336	31	37	54	43	0	98	394	292	48
28	6	3,477	123	175	343	187	144	134	137	0	266	1,107	692	169
29	3	1,690	68	106	381	75	107	158	44	0	153	305	279	14
30	2	1,215	8	49	69	33	137	113	55	0	13	412	258	68
31	2	1,177	25	105	255	60	38	27	64	12	73	282	156	80
32	1	660	45	77	186	46	29	8	24	30	65	124	21	5
33	5	3,702	73	296	547	238	289	158	61	0	114	1,029	582	315
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	2	1,817	40	119	300	140	86	68	32	0	60	465	381	126
36	1	933	58	68	96	185	59	83	0	0	54	252	69	9
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	1	1,060	91	69	228	95	56	104	32	0	5	157	203	20
Total	1,079	150,156	1,112	3,143	7,522	2,436	2,708	3,508	2,087	2,349	38,252	64,162	20,384	2,493

Table 15.--Lumber tally volume by 1-inch diameter class for log grade 9

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
<i>Volume by grade--</i>														
12	1	63	0	0	0	0	0	0	0	0	0	31	12	20
13	1	123	0	0	0	0	0	0	0	0	8	115	0	0
14	0	--	--	--	--	--	--	--	--	--	--	--	--	--
15	0	--	--	--	--	--	--	--	--	--	--	--	--	--
16	1	132	0	0	0	0	0	0	0	0	0	24	108	0
17	3	553	0	6	4	0	0	0	6	0	4	162	283	88
18	2	493	0	53	43	8	0	0	0	5	46	86	98	154
19	3	605	7	0	27	13	0	0	13	0	82	271	109	83
20	2	406	0	13	7	0	0	15	0	0	59	130	74	108
21	1	230	0	0	0	0	0	0	15	0	0	71	58	86
22	2	631	0	10	32	11	0	0	0	0	12	277	155	134
23	1	347	0	0	16	0	0	13	0	0	0	25	153	140
24	1	323	0	0	22	0	0	0	0	0	3	56	145	97
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	2	860	28	51	80	100	37	17	8	0	54	170	170	145
27	1	435	0	3	24	0	0	0	0	0	0	40	107	261
28	1	378	0	14	38	0	0	0	0	0	0	19	87	220
29	2	902	19	78	105	52	8	37	12	0	0	178	243	170
30	2	1,084	34	72	213	44	17	105	33	0	0	109	300	157
31	1	392	10	61	43	8	0	12	17	0	5	72	49	115
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	1	656	0	83	85	18	32	0	0	0	0	31	123	284
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	1	1,037	0	28	179	43	0	0	0	0	0	305	306	176
Total	29	9,650	98	472	918	297	94	199	104	5	273	2,172	2,580	2,438



Table 16.--Lumber tally volume by 1-inch diameter class for all log grades

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
4	1	14	0	0	0	0	0	0	0	0	0	3	11	0
5	5	77	0	0	0	0	0	0	0	3	29	20	19	6
6	40	754	0	0	5	0	0	0	0	13	282	288	137	29
7	115	3,294	5	21	12	11	0	0	0	31	1,059	1,558	547	50
8	127	4,597	0	24	14	14	7	0	0	116	1,363	2,221	763	75
9	142	6,683	0	6	39	20	0	0	0	147	2,310	3,172	942	47
10	139	8,608	10	3	77	0	0	4	0	140	3,537	3,944	825	68
11	119	9,790	11	22	113	25	8	0	0	352	3,949	4,254	1,000	56
12	110	10,735	17	26	202	13	0	0	0	215	4,440	4,518	1,189	66
13	94	10,776	21	117	240	30	0	0	0	243	3,991	4,588	1,416	75
14	83	11,036	4	63	185	31	0	17	3	195	4,029	5,023	1,379	107
15	68	10,735	33	102	234	82	61	76	42	113	3,638	4,911	1,337	106
16	51	9,266	9	98	226	29	13	47	62	207	3,005	4,402	1,051	117
17	53	10,973	69	224	429	124	92	175	180	265	2,858	5,143	1,217	197
18	34	8,208	61	225	420	66	118	121	140	133	1,805	3,726	1,159	234
19	35	8,706	20	252	457	126	219	394	214	150	1,621	3,832	1,239	182
20	31	8,819	17	281	535	127	259	400	193	104	1,555	3,850	1,293	205
21	31	9,545	80	412	674	177	462	423	206	112	1,750	3,617	1,361	271
22	20	6,847	23	241	659	232	161	387	147	16	840	2,681	1,235	228
23	15	5,587	30	125	621	193	306	270	147	143	597	2,288	687	180
24	14	5,830	43	236	543	208	232	308	143	36	406	2,500	955	220
25	17	6,776	196	485	801	284	294	140	142	99	410	2,189	1,260	476
26	11	5,145	130	322	675	415	340	302	100	36	403	1,419	805	198
27	9	3,717	212	445	621	249	49	66	43	0	182	806	587	457
28	12	6,299	297	487	694	454	202	219	175	0	339	1,687	1,204	541
29	10	5,398	248	446	927	535	286	321	120	7	207	915	1,096	290
30	6	3,384	153	397	413	187	162	230	88	0	20	655	739	340
31	10	6,183	142	809	1,364	485	38	47	129	34	193	1,378	887	677
32	5	3,739	117	525	1,132	291	82	54	40	36	185	542	518	217
33	7	5,439	305	752	884	475	337	205	61	0	119	1,190	734	377
34	3	2,254	123	344	336	139	32	16	16	0	76	476	362	334
35	4	3,620	46	471	835	342	86	84	32	0	116	792	562	254
36	6	5,578	273	662	1,061	748	194	181	22	0	105	975	797	560
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	1	1,060	91	69	228	95	56	104	32	0	5	157	203	20
39	2	2,055	308	547	453	253	0	16	16	11	98	181	116	56
40	0	--	--	--	--	--	--	--	--	--	--	--	--	--
41	1	1,176	87	519	234	145	0	0	0	7	25	67	37	55
Total	1,431	212,703	3,181	9,758	16,343	6,605	4,096	4,628	2,573	2,964	45,547	79,968	29,669	7,371

Table 17.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 1

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i> <i>Percentage of lumber tally volume</i>														
21	1	227	4.41	30.84	4.41	19.38	0	0	0	3.52	3.52	3.52	8.37	22.03
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--
23	1	405	0	10.37	15.06	7.90	2.72	0	0	11.11	25.68	22.22	4.94	0
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	0	--	--	--	--	--	--	--	--	--	--	--	--	--
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	1	435	1.38	1.15	9.89	0	5.98	6.44	7.36	0	0	21.38	30.57	15.86
29	1	615	0	6.83	14.63	12.03	7.80	4.88	7.80	0	.65	12.03	33.33	0
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	0	--	--	--	--	--	--	--	--	--	--	--	--	--
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1	860	10.70	32.09	27.79	13.37	0	1.86	0	1.28	0	4.65	3.14	5.12
Total	5	2,542	4.25	17.11	17.43	10.42	3.34	2.91	3.15	2.52	4.56	12.00	15.89	6.41

Table 18.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 2

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
8	1	39	0	17.95	0	0	0	0	0	0	17.95	51.28	12.82	0
9	0	--	0	--	0	0	0	0	0	0	--	--	--	--
10	1	62	0	0	6.45	0	0	0	0	0	54.84	38.71	0	0
11	3	215	0	1.40	2.79	1.40	0	0	0	2.33	56.28	35.81	0	0
12	3	316	3.80	0	14.56	1.58	0	0	0	2.53	38.29	33.23	4.75	1.27
13	2	207	0	5.80	11.59	0	0	0	0	0	38.16	32.85	11.59	0
14	2	259	0	0	6.95	0	0	0	0	3.09	25.10	38.61	15.44	10.81
15	1	170	12.35	0	13.53	0	0	4.71	0	0	32.35	29.41	0	0
16	2	350	1.71	5.14	10.86	0	0	0	0	16.00	36.57	8.29	13.71	7.71
17	1	223	1.35	2.24	13.90	0	4.48	5.83	0	0	0	65.02	7.17	0
18	1	165	3.03	21.82	21.82	2.42	0	0	0	0	0	18.79	20.61	11.52
19	5	1,359	.96	11.55	14.05	.96	5.96	2.94	0	0	8.83	29.80	18.47	3.75
20	4	1,199	.42	10.84	16.18	4.59	5.17	2.09	0	3.84	17.18	33.53	5.67	.50
21	5	1,629	1.96	8.53	13.57	2.27	6.81	4.60	0	0	21.12	29.71	10.80	.61
22	2	752	0	3.99	22.74	6.91	2.13	0	0	0	16.76	44.81	1.99	.66
23	4	1,675	.72	3.16	19.40	8.00	6.39	1.31	3.70	2.51	10.09	32.90	10.15	1.67
24	2	905	.44	8.07	10.50	10.83	7.07	12.93	.55	.66	12.04	23.20	10.83	2.87
25	5	2,050	4.83	12.20	14.73	5.46	3.76	1.12	1.90	2.24	2.34	30.24	14.54	6.63
26	1	587	2.04	19.25	16.35	7.16	3.41	10.90	0	0	5.79	21.47	11.41	2.21
27	4	1,684	6.53	16.57	15.50	12.95	.71	.71	0	0	4.99	22.09	11.16	8.79
28	4	2,009	8.36	14.58	13.44	13.29	1.59	2.84	.30	0	3.63	23.30	14.53	4.13
29	4	2,191	7.35	10.04	16.02	15.24	5.61	4.38	.73	.32	2.28	16.34	16.84	4.84
30	2	1,085	10.23	25.44	12.07	10.14	.74	1.11	0	0	.65	12.35	16.68	10.60
31	7	4,614	2.32	13.94	23.10	9.04	0	.17	1.04	.48	2.49	22.19	14.78	10.45
32	4	3,079	2.34	14.55	30.72	7.96	1.72	1.49	.52	.19	3.90	13.58	16.14	6.89
33	2	1,737	13.36	26.25	19.40	13.64	2.76	2.71	0	0	.29	9.27	8.75	3.57
34	2	1,598	7.70	16.33	15.71	7.57	0	1.00	1.00	0	4.76	27.85	14.96	3.13
35	2	1,803	.33	19.52	29.67	11.20	0	.89	0	0	3.11	18.14	10.04	7.10
36	3	2,591	2.70	16.06	23.35	16.71	.46	3.47	.85	0	.73	9.38	11.96	14.32
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--	--	--	--	--
39	1	1,195	18.08	22.68	17.91	11.55	0	0	1.34	0	8.20	11.80	7.45	1.00
40	0	--	--	--	--	--	--	--	--	--	--	--	--	--
41	1	1,176	7.40	44.13	19.90	12.33	0	0	0	.60	2.13	5.70	3.15	4.68
Total	81	36,924	4.57	14.82	19.02	9.27	2.26	2.13	.77	.70	6.75	21.51	12.30	5.90



Table 19.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 3

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
Board feet														
Percentage of lumber tally volume														
4	1	14	0	0	0	0	0	0	0	0	0	21.43	78.57	0
5	4	61	0	0	0	0	0	0	0	0	0	26.23	31.15	9.84
6	26	489	0	0	.41	0	0	0	0	1.23	32.79	41.31	19.22	5.52
7	60	1,657	0	.97	.42	.36	0	0	0	.91	30.90	47.01	18.11	1.33
8	46	1,594	0	0	.19	0	0	0	0	2.13	30.05	48.49	18.13	1.00
9	29	1,287	0	0	0	0	0	0	0	4.04	37.53	42.66	15.00	.78
10	30	1,897	0	0	.53	0	0	0	0	3.69	47.60	38.22	9.96	0
11	12	915	.55	0	2.30	0	0	0	0	.44	35.08	51.26	10.38	0
12	10	955	0	0	.42	0	0	0	0	.52	47.02	42.51	9.53	0
13	6	720	1.11	4.72	1.81	0	0	0	0	5.00	49.17	26.67	11.53	0
14	4	577	0	0	.87	0	0	0	0	1.56	48.53	36.05	11.09	1.91
15	2	293	0	0	1.02	1.71	4.44	0	0	4.44	53.24	26.62	8.53	0
16	1	204	0	0	14.71	0	0	0	0	0	7.84	61.27	16.18	0
17	0	--	--	--	--	--	--	--	--	--	--	--	--	--
18	0	--	--	--	--	--	--	--	--	--	--	--	--	--
19	1	292	0	2.05	8.90	9.25	12.67	0	0	4.79	16.44	31.51	14.38	0
20	2	598	0	.33	2.01	0	11.20	2.17	1.17	0	17.39	62.21	2.84	.67
21	0	--	--	--	--	--	--	--	--	--	--	--	--	--
22	0	--	--	--	--	--	--	--	--	--	--	--	--	--
23	0	--	--	--	--	--	--	--	--	--	--	--	--	--
24	0	--	--	--	--	--	--	--	--	--	--	--	--	--
25	1	360	2.78	4.72	15.83	0	10.00	2.78	3.33	8.06	12.22	31.94	8.33	0
26	1	501	1.60	2.00	12.77	11.98	19.36	5.79	0	0	10.58	21.56	14.37	0
27	0	--	--	--	--	--	--	--	--	--	--	--	--	--
28	0	--	--	--	--	--	--	--	--	--	--	--	--	--
29	0	--	--	--	--	--	--	--	--	--	--	--	--	--
30	0	--	--	--	--	--	--	--	--	--	--	--	--	--
31	0	--	--	--	--	--	--	--	--	--	--	--	--	--
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	1	1,017	14.26	14.75	17.80	8.55	12.09	.79	0	0	3.15	17.21	11.01	.39
Total	237	13,431	1.31	1.75	3.26	1.38	2.78	.45	.14	2.14	32.85	40.11	13.10	.74

Table 20.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 4

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i> <i>Percentage of lumber tally volume</i>														
5	1	16	0	0	0	0	0	0	0	18.75	56.25	25.00	0	0
6	14	265	0	0	1.13	0	0	0	0	2.64	46.79	32.45	16.23	.75
7	55	1,637	.31	.31	.31	.31	0	0	0	.98	33.41	47.59	15.09	1.71
8	80	2,964	0	.57	.37	.47	0	0	0	2.77	29.59	48.18	15.82	1.99
9	113	5,396	0	.11	.72	.37	.24	0	0	1.76	33.86	48.61	13.88	.69
10	108	6,649	.15	.05	.95	0	0	.06	0	1.05	39.10	48.05	9.57	1.02
11	104	8,660	.07	.22	.99	.25	.09	0	0	3.96	40.50	42.82	10.45	.65
12	96	9,401	.05	.28	1.62	.09	0	0	.52	2.15	41.17	42.29	11.39	.45
13	85	9,726	.13	.73	2.09	.31	0	.22	.35	2.13	36.50	43.32	13.46	.77
14	77	10,200	.04	.62	1.59	.30	0	.17	.03	1.75	36.12	46.23	12.50	.67
15	65	10,272	.12	.87	2.02	.75	.47	.66	.41	.97	33.36	46.56	12.77	1.03
16	47	8,580	.03	.93	1.84	.75	.15	.55	.72	1.76	33.34	49.23	10.05	1.05
17	49	10,197	.65	2.09	3.86	1.22	.80	1.59	1.71	2.60	27.99	47.43	9.00	1.07
18	31	7,550	.74	1.80	4.52	.72	1.56	1.60	1.85	1.70	23.30	47.80	13.60	.81
19	26	6,450	0	1.38	3.30	1.13	1.57	5.49	2.54	2.11	21.26	47.50	12.98	.74
20	23	6,616	.18	2.06	4.87	1.09	1.96	5.24	2.81	.88	17.93	44.53	17.14	1.31
21	24	7,459	.51	2.72	5.94	1.29	4.71	4.67	2.56	1.39	18.74	40.94	14.85	1.68
22	16	5,464	.42	3.68	8.35	3.09	2.65	7.08	2.64	.29	12.85	37.83	19.49	1.63
23	9	3,160	.57	.95	6.93	.85	5.95	7.44	2.69	1.77	10.25	51.33	10.89	.38
24	11	4,602	.85	3.54	9.26	3.94	3.65	4.15	3.00	.65	6.39	48.54	15.47	2.11
25	11	4,366	1.99	4.99	10.12	3.94	4.15	2.45	2.08	.55	7.28	33.30	21.35	7.79
26	7	3,197	2.56	4.63	13.61	6.66	5.82	6.01	2.88	1.13	8.20	31.75	15.51	1.25
27	4	1,598	6.38	10.20	21.03	1.94	2.32	3.38	2.69	0	6.13	24.66	18.27	3.00
28	6	3,477	3.54	5.03	9.86	5.38	4.14	3.85	3.94	0	7.65	31.84	19.90	4.86
29	3	1,690	4.02	6.27	22.54	4.44	6.33	9.35	2.60	0	9.05	18.05	16.51	.83
30	2	1,215	.66	4.03	5.68	2.72	11.28	9.30	4.53	0	1.07	33.91	21.23	5.60
31	2	1,177	2.12	8.92	21.67	5.10	3.23	2.29	5.44	1.02	6.20	23.96	13.25	6.80
32	1	660	6.82	11.67	28.18	6.97	4.39	1.21	3.64	4.55	9.85	18.79	3.18	.76
33	5	3,702	1.97	8.00	14.78	6.43	7.81	4.27	1.65	0	3.08	27.80	15.72	8.51
34	0	--	--	--	--	--	--	--	--	--	--	--	--	--
35	2	1,817	2.20	6.55	16.51	7.71	4.73	3.74	1.76	0	3.30	25.59	20.97	6.93
36	1	933	6.22	7.29	10.29	19.83	6.32	8.90	0	0	5.79	27.01	7.40	.96
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	1	1,060	8.58	6.51	21.51	8.96	5.28	9.81	3.02	0	.47	14.81	19.15	1.89
Total	1,079	150,156	.74	2.09	5.01	1.62	1.80	2.34	1.39	1.56	25.47	42.73	13.58	1.66

Table 21.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for log grade 9

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
<i>Percentage of lumber tally volume</i>														
12	1	63	0	0	0	0	0	0	0	0	0	49.21	19.05	31.75
13	1	123	0	0	0	0	0	0	0	0	6.50	93.50	0	0
14	0	--	--	--	--	--	--	--	--	--	--	--	--	--
15	0	--	--	--	--	--	--	--	--	--	--	--	--	--
16	1	132	0	0	0	0	0	0	0	0	0	18.18	81.82	0
17	3	553	0	1.08	.72	0	0	0	1.08	0	.72	29.29	51.18	15.91
18	2	493	0	10.75	8.72	1.62	0	0	0	1.01	9.33	17.44	19.88	31.24
19	3	605	1.16	0	4.46	2.15	0	0	2.15	0	13.55	44.79	18.02	13.72
20	2	406	0	3.20	1.72	0	0	3.69	0	0	14.53	32.02	18.23	26.60
21	1	230	0	0	0	0	0	0	6.52	0	0	30.87	25.22	37.39
22	2	631	0	1.58	5.07	1.74	0	0	0	0	1.90	43.90	24.56	21.24
23	1	347	0	0	4.61	0	0	3.75	0	0	0	7.20	44.09	40.35
24	1	323	0	0	6.81	0	0	0	0	0	.93	17.34	44.89	30.03
25	0	--	--	--	--	--	--	--	--	--	--	--	--	--
26	2	860	3.26	5.93	9.30	11.63	4.30	1.98	.93	0	6.28	19.77	19.77	16.86
27	1	435	0	.69	5.52	0	0	0	0	0	0	9.20	24.60	60.00
28	1	378	0	3.70	10.05	0	0	0	0	0	0	5.03	23.02	58.20
29	2	902	2.11	8.65	11.64	5.76	.89	4.10	1.33	0	0	19.73	26.94	18.85
30	2	1,084	3.14	6.64	19.65	4.06	1.57	9.69	3.04	0	0	10.06	27.68	14.48
31	1	392	2.55	15.56	10.97	2.04	0	3.06	4.34	0	1.28	18.37	12.50	29.34
32	0	--	--	--	--	--	--	--	--	--	--	--	--	--
33	0	--	--	--	--	--	--	--	--	--	--	--	--	--
34	1	656	0	12.65	12.96	2.74	4.88	0	0	0	0	4.73	18.75	43.29
35	0	--	--	--	--	--	--	--	--	--	--	--	--	--
36	1	1,037	0	2.70	17.26	4.15	0	0	0	0	0	29.41	29.51	16.97
Total	29	9,650	1.02	4.89	9.51	3.08	.97	2.06	1.08	.05	2.83	22.51	26.74	25.26



Table 22.--Lumber grade recovery as a percentage of lumber tally volume by 1-inch diameter class for all log grades

Log scaling diameter (inches)	Number of logs	Total lumber tally volume	B & Btr. Select	C Select	D Select	Molding	No. 3 Clear	No. 1 Shop	No. 2 Shop	No. 1 Common	No. 2 Common	No. 3 Common	No. 4 Common	No. 5 Common
<i>Board feet</i>														
4	1	14	0	0	0	0	0	0	0	0	0	21.43	78.57	0
5	5	77	0	0	0	0	0	0	0	3.90	37.66	25.97	24.68	7.79
6	40	754	0	0	0	0	0	0	0	1.72	37.40	38.20	18.17	3.85
7	115	3,294	.15	.64	.66	0	0	0	0	.94	32.15	47.30	16.61	1.52
8	127	4,597	0	.52	.30	.33	0	0	0	2.52	29.65	48.31	16.60	1.63
9	142	6,683	0	.09	.58	.30	0	0	0	2.20	34.57	47.46	14.10	.70
10	139	8,608	.12	.03	.89	0	0	.05	0	1.63	41.09	45.82	9.58	.79
11	119	9,790	.11	.22	1.15	.26	.08	0	0	3.60	40.34	43.45	10.21	.57
12	110	10,735	.16	.24	1.88	.12	0	0	.46	2.00	41.36	42.09	11.08	.61
13	94	10,776	.19	1.09	2.23	.28	0	.19	.32	2.26	37.04	42.58	13.14	.70
14	83	11,036	.04	.57	1.68	.28	0	.15	.03	1.77	36.51	45.51	12.50	.97
15	68	10,735	.31	.95	2.18	.76	.57	.71	.39	1.05	33.89	45.75	12.45	.99
16	51	9,266	.10	1.06	2.44	.31	.14	.51	.67	2.23	32.43	47.51	11.34	1.26
17	53	10,973	.63	2.04	3.91	1.13	.84	1.59	1.64	2.42	26.05	46.87	11.09	1.80
18	34	8,208	.74	2.74	5.12	.80	1.44	1.47	1.71	1.62	21.99	45.39	14.12	2.85
19	35	8,706	.23	2.89	5.25	1.45	2.52	4.53	2.46	1.72	18.62	44.02	14.23	2.09
20	31	8,819	.19	3.19	6.07	1.44	2.94	4.54	2.19	1.78	17.63	43.66	14.66	2.32
21	31	9,545	.84	4.32	7.06	1.85	4.84	4.43	2.16	1.17	18.33	37.89	14.26	2.84
22	20	6,847	.34	3.52	9.62	3.39	2.35	5.65	2.10	.23	12.27	39.16	18.04	3.33
23	15	5,587	.54	2.24	11.12	3.45	5.48	4.83	2.63	2.56	10.69	40.95	12.30	3.22
24	14	5,830	.74	4.05	9.31	3.57	3.98	5.28	2.45	.62	6.96	42.88	16.38	3.77
25	17	6,776	2.89	7.16	11.82	4.19	4.34	5.07	2.10	1.46	6.05	32.31	18.60	7.02
26	11	5,145	2.53	6.26	13.12	8.07	6.61	5.87	1.94	.70	7.83	27.58	15.65	3.85
27	9	3,717	5.70	11.97	16.71	6.70	1.32	1.78	1.16	0	4.90	21.68	15.79	12.29
28	12	6,299	4.72	7.73	11.02	7.21	3.21	3.48	2.78	0	5.38	26.78	19.11	8.59
29	10	5,398	4.59	8.26	17.17	9.91	5.30	5.95	2.22	.13	3.83	16.95	20.30	5.37
30	6	3,384	4.52	11.73	12.20	5.53	4.79	6.80	2.60	0	.59	19.36	21.84	10.05
31	10	6,183	2.30	13.08	22.06	7.84	.61	.76	2.09	.55	3.12	22.29	14.35	10.95
32	5	3,739	3.13	14.04	30.28	7.78	2.19	1.44	1.07	.96	4.95	14.50	13.85	5.80
33	7	5,439	5.61	13.83	16.25	8.73	6.20	3.77	1.12	0	2.19	21.88	13.50	6.93
34	3	2,254	5.46	15.26	14.91	6.17	1.42	.71	.71	0	3.37	21.12	16.06	14.82
35	4	3,620	1.27	13.01	23.07	9.45	2.38	2.32	.88	0	3.20	21.88	15.52	7.02
36	6	5,578	4.89	11.87	19.02	13.41	3.48	3.24	.39	0	1.88	17.48	14.29	10.04
37	0	--	--	--	--	--	--	--	--	--	--	--	--	--
38	1	1,060	8.58	6.51	21.51	8.96	5.28	9.81	3.02	0	.47	14.81	19.15	1.89
39	2	2,055	14.99	26.62	22.04	12.31	0	.78	.78	.54	4.77	8.81	5.64	2.73
40	0	--	--	--	--	--	--	--	--	--	--	--	--	--
41	1	1,176	7.40	44.13	19.90	12.33	0	0	0	.60	2.13	5.70	3.15	4.68
Total	1,431	212,703	1.50	4.57	7.70	3.09	1.93	2.18	1.21	1.39	21.41	37.61	13.95	3.46

Plank, Marlin E., and Thomas A. Snellgrove

1973. Lumber yield from western white pine in northern Idaho. USDA Forest Serv. Res. Pap. PNW-153, 30 p., illus. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

In a lumber recovery study, 1,431 western white pine logs were sawn in northern Idaho. Lumber yields by log grade and diameter class are shown together with curves of percent lumber recovery by diameter for various lumber grade groupings.

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